SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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MINING IN AUSTRALASIA—MONTHLY SUMMARY.

[FROM OUR OWN CORRESPONDENT]

ADELAIDE, JAN. 27.—Since my last mining matters here have made but moderate progress, still there has been progress; but the deficiency of capital, except in the case of some half dozen or so of our best mines, will for some time be a bar to rapid development. A few hundreds of thousands of capital, and a few thousands of miners, would soon enable us to show results that would astonish the world.

The MOONTA MINES are yielding more ore than ever, and a fresh place has been opened on one of the lodes, where there is a course of solid ore of splendid quality, 5 ft. in width. An engine being now employed in pumping, and various appliances to facilitate the workings being introduced as they are required, the wonderful richness of this extraordinary mine are being proved in length, breadth, and depth. In about six weeks I believe the great trial for proprietorship is likely to come before the Supreme Court. The present holders seem confident of retaining the mines, but the plaintiffs are equally confident, and promise yet more astounding disclosures than any brought before the Parliamentary Committee. Time will show.

The BURRA BURRA MINE is scarcely producing as much ore as it did some years since, but the falling off is gradual, and amounts to no very large proportion of the whole yield in the course of the year. I mention this because of the frequent rumours that the Burra "is nearly worked out." Such rumours are absurd and groundless; the present workings extend only to the 55 fm. level, and the shaft is sunk to 70 fms., at which level drives were extended some years since, showing the ore to be going down all the way; but afterwards it was thought more profitable to let the water into the 55, and raise ore from the higher levels. The Burra Company, therefore, know of 15 fathoms of ore-bearing ground below their present workings, besides having still large reserves above that level. Again, the present workings extend over a comparatively small area of ground, and it is highly probable, should the necessity arise, that fresh discoveries might be made in other parts of the land held by the company. Of all the northern mines the YUDANAMUTANA and WHEAL BLINMAN stand pre-eminent. The yield of ore is increasing, and the permanent nature of the mines appears now to be quite satisfactorily proved, from the nature of the ore and of the country at the deepest levels. The ore is exceedingly rich grey and black sulphurets. As usual, I leave the details to be supplied by the official reports, but I may say that from private information I learn that the mines are looking exceedingly well. Smelting operations, which have been commenced very favourably at the Blinman, will add 50 per cent. to the value of the property; but, in my opinion, a still more important help to these mines would be the carrying out of the projected tram, or railway, to the mines. The benefits would be mutual, and the encouragement given to such an undertaking would be considerable, besides that which is offered by the Government. There is, perhaps, no part of the colony of South Australia which offers such inducements for the construction of a line of railway as that to the north of Port Augusta. The *Advertiser*, in its summary of news to-day, has a good article on the subject; and Mr. Austin's very useful work on "The Mines of South Australia" gives, in its last chapter, some valuable information respecting the prospects for the formation of a railway.

We hear but little of the KAPUNDA MINE, but if what we hear is to be believed, it is not now in a very prosperous state, although some 260 or 270 tons of 16 per cent. ore are raised every month, the total number of hands employed being about 300, and the total expenses of the mine and smelting works nearly 4000*l.* a month. Here, as at the Burra, it is probable that further explorations in new ground would be rewarded by fresh discoveries.

Adjoining the Kapunda Mine, on the south, is another, the working of which was commenced and carried on for a time, many years ago, but was abandoned in consequence of the quickness of the water. Since the Kapunda Mine has been pumping from the 60 fm. level, the whole country around has been drained to a considerable extent, and operations at the SOUTH KAPUNDA MINE might have been resumed by some tributers with very encouraging results. It is only about three months since they commenced, and already twelve men have raised about 80 tons of rich ore.

There is another discovery, the locality of which has not yet been made public, but it is somewhere about the latitude of Kapunda; and I think within 20 miles to the east of that mine. The samples of grey copper ore brought from the surface are very good, and there is said to be a large champion lode. Another lode, containing very considerable quantities of rich hematite of iron, is found on the same property.

Other discoveries are spoken of in various parts of the colony, including two or three in the neighbourhood of Wallaroo, but particulars are at present a secret. The lode has been cut at the Bradford Mine, on the Finniss, at a depth of 4½ fms., and contains some good carbonate of copper.

The KANAPPA, another of our recent mines, near the South Rhine and the Murray Scrub, appears to be turning out very well indeed. A fine lode of excellent copper ore is being worked, and a cross-course has been cut containing rich plumbago.

The SPRING CREEK MINE, near Mount Remarkable, is said to bid fair to realise the most sanguine hopes of its promoters. A good amount of work has been accomplished, at a moderate cost. A shaft has been sunk about 16½ fathoms, and an adit driven to meet it nearly 40 fms., in which two lodes have been cut, containing beautiful ore, grey and red oxide and carbonates of copper. A considerable quantity of ore is available for stoping in the backs.

The TALISKER SILVER-LEAD MINE continues to prosper. The newly-discovered lode is turning out very well, and appears likely to equal anything hitherto found there. The adjoining sections, the property of the Campbell's Creek Mining Company, are now being satisfactorily developed, and may ere long rival their more fortunate neighbours.

The Worthing Mining Company's BREMER MINE is steadily improving, and the yield of ore for the past month was the largest ever raised in the same time—240 tons. The slide of ground under the 53 having been cut through, the lode beneath is large and good; the stopes are yielding well, and the winze from the 43 is going down through ore, so that large returns may be expected.

The ORATUNGA and NUCCALEENA MINES, belonging to the Great Northern Company, are stated to have greatly improved, but operations were suspended on the Oratunga.

The WEST KANMANTOO MINE is slowly improving, but the present depth is only about 16 fathoms. A lode of fine ore is being worked in the bottom.

The PARINGA MINE, adjoining, would be a most profitable property for an English company to work. The want of capital in the colony has interfered with the formation of a local company, but of the great value of the mine there can be no doubt, and much has already been done in the way of opening the ground, and there are 20 fathoms of backs, and three or four fine lodes to work upon, the shaft being 41 fms. in depth.

WHEAL ELLEN shows considerable signs of improvement, and it is expected before long that the results will be very gratifying. The quantity of gold found in the gossan in this and some other mines in the colony would alone pay for working, with proper appliances.

The ADELAIDE MINE, within 12 miles of the city, is another where gold is found in the gossan; it is also a highly promising copper mine, and some few tons of splendid ore have been raised during the past two months by only six men. Other discoveries have recently been made in the same neighbourhood.

The NEW CORNWALL MINE has lately produced some fine samples of rich silicate of copper, a very uncommon ore in this colony. The mine is slowly improving, as also is the KARKARILLA near the Moonta. At present the prospects of the Karkarilla are very good, a fine lode being in course of working at the depth of 30 fathoms.

On a review of our mining matters for the month, they may be considered satisfactory, and the prospects decidedly encouraging, but no very rapid advances can be expected until more adequate capital is brought to bear on the development of our immense mineral resources.

MELBOURNE, JAN. 26.—As was anticipated, the yield of gold for the year is not quite equal to that of 1862. There is a deficiency in the total yield of 20,000 or 30,000 ozs., but the increase of machinery, and the improved processes for saving gold, promise better for the present year. Great results are anticipated from the quartz reefs in Gipps Land and the Dividing Range. The reports already received speak of the yields as extraordinarily rich. This new mining district is as large as all our other gold fields put together, but is very difficult of access, being very mountainous. The deep leads of Ballarat still prove to be very rich. For example, the Koh-i-noor Company lately washed out 459 ozs. of gold in three days, and declared a dividend of 60*l.* per share for ten days' work. Several other companies are equally fortunate. From Bendigo we hear accounts of rich stone being raised. The Raywood wash also is turning out well, producing over 2000 ozs. weekly. At Tanengower some of the reefs are expected to yield from 12 to 20 ozs. per ton. During the year the total clearances of gold amounted to 1,998,501 ozs., of which 1,634,377 ozs. were from Victoria, and 364,124 ozs. were transhipped from New Zealand. The clearances during the year 1862 were 2,019,839 ozs.—1,711,508 ozs. being from Victoria, and 308,331 ozs. from New Zealand.

AUSTRALIAN MINES.

KAPUNDA.—The quantity of ore raised in November was 275 tons, of 17¾ per cent. Average produce equal to 47½ tons of pure copper, exclusive of 50 tons of sulphur ores for flux. The quantity raised in December is estimated at about 290 tons, of good average produce. The copper last advised as in course of shipment per *Alwynton* has been transferred to the *Indus*, in which vessel 40 tons had already been shipped, and freight engaged for further 50 tons.

YUDANAMUTANA.—In consequence of the non-arrival at Adelaide of the letter-bags from the northern districts prior to the departure of the homeward mail, no advices relative to the progress of operations at the various mines have come to hand from Captain Anthony. The following extract, however, is taken from the *South Australian Advertiser* of January 27:—"The reports from the Yudanamutana Mines continue very good. The lode in the 16 is 1 ft. wide, of rich black ore; the stopes upon the section 135A continue to yield their usual supply of rich grey ore, and the big stope is looking as well as ever. At the Blinman the sinking on the course of the lode is most promising; for 3 fathoms below the 16 it is from 6 to 10 feet wide in the ends. On the eastern side it is about 20 per cent. as it stands, and soft for breaking. The big bunch is now 14 fathoms deep, and as good as ever. It now assumes the form of a basin of 12 feet diameter; the ore is of a dark grey oxide, intermixed with carbonates. It is altogether the finest bunch I have ever seen. The fire was lit in the smelting-furnace on the 8th inst. The work is well seasoned, and we shall commenced to run into regulus on Monday. The ore is easily found, so we may expect the best results."

WORTHING.—Cost for the month, 1542*l.*; ore raised and dressed, 240 tons—the largest quantity yet raised at the mine in four weeks of average quality. The smelting had been suspended owing to the harvest, but the captain expected to commence again immediately, and in the meantime had taken the opportunity to put the furnaces into a complete state of repair. The south end of the 53 fm. level had been driven across the lode 7 fms., orey throughout, an important feature, as the ore was of a higher class than in the levels above. At the north of the 53 fm. level, Legg's engine-shaft, the lode had greatly improved, being now rich peacock ore, in white sandy quartz. The mine continues to improve, and the committee were sanguine that much larger quantities of ore could be raised, and the returns greatly increased, as soon as more smelting power came into use. The ore on hand and dressed, 350 tons.

GREAT NORTHERN COPPER.—Mr. Charles Bonney (Adelaide, Jan. 26) states:—"The northern mail was stopped last week by a heavy fall of rain, and in consequence of this delay we have not received the captain's monthly report. I must, therefore, endeavour to supply the deficiency as well as I can, by giving the result of my own observations during my recent visit to the mines. At the Nuccaleena Mine the ground still continues hard, and the rate at which they are sinking is proportionately slow. Yellow ore is still found coating the interstices of the rock, which the miners interpret as a sign of a strong lode in the vicinity, and it is to be hoped that their predictions will be verified by the result. The work done at the Oratunga Mine comprises the erection of a whim, and the enlargement of the shaft, to enable the buckets to work. The shaft has also been deepened a few feet. When I visited the mine they were driving on the course of the lode, and had got 6 or 8 ft. beyond the whim-shaft. The appearance of the lode had decidedly improved at the end of the drive. Some very excellent yellow and peacock ore was found intermixed with the heavy spar which forms the matrix of the lode, but it was dispersed through too much waste to pay expenses. Had there been more of a "back," as the miners term it—that is, had the lode been of a greater depth—it would, probably, have paid to work on tribute. But, under the circumstances, seeing that there was no object to be gained in following this shallow bed of ore ground, and the last communication which I had then received from you having intimated that the board of directors did not desire the renewal of operations at any of the other sections, but that our resources should be concentrated on the development of Nuccaleena only, I thought it advisable to stop further works at Oratunga."

WHEAL ELLEN.—Mr. Alfred Hallett, the manager, and Capt. Barker (Sirathalbyn, Jan. 22) report—The cost-sheet for the month ending Jan. 2 amounts to 346*l.* 4*s.* 11*d.* Squarey's engine-shaft measured on survey-day 3 ft. below the 30 fm. level, and is now about 7 feet deeper; though not yet timbered, it has yielded about 35 cwts. of lead and 3 cwts. of yellow sulphurate of copper in the last 7 ft. sinking, and though not looking quite so promising at present, we think it will improve shortly. The 40 fm. level end, north of Scott's shaft, measured 1 fm. 4 ft. 4 in., at 21*l.* to 23*l.*, and has yielded 2 to 4 tons per fm., and is at present yielding about 1 ton, quality low. The nobbled ore is being treated, and we purpose trying a small lot in the blast-furnace immediately, in order to forward you the result in time for the mail. The work at Bassett's shaft has been delayed, in consequence of a crush in the old works, which extended to the shaft, breaking several sets of timber, and entailing a considerable quantity of extra labour; this is now secure, and we anticipate commencing to draw water at an early date. The engine, engine-house, and pond are now nearly finished, the carpenter having the floor and friction rollers for whim chain only to finish. On trying the engine a few hours last week we are happy to say everything worked extremely well. The secretary of the colonial committee also writes as follows, under date, Adelaide, Jan. 27—"Mr. Hallett has just returned from the mine, having been making a trial of the smelting in the dry way, and reports partial success, being able to get the ores to run down with a thin slag, but it is doubtful. The zinc takes away a large portion of the lead into the flues. Full particulars by next mail."

ENGLISH AND AUSTRALIAN COPPER.—Jan. 27: The stock of coal at Port Adelaide was 470 tons, at Kapunda 94 tons, and at Kooringa 363 tons, besides shipments afloat. The furnaces at the Burra were let out for the summer period. At the port works there were six furnaces and one refinery at work. Since the date of the last advices a shipment of 34 tons 5 cwts. of copper had been made to England. The manager writes:—"Our horses and mules are looking well, and doing well, and we have secured an abundant supply of hay on very easy terms."

PORT PHILLIP AND COLONIAL GOLD.—The quantity of quartz crushed during December was 3204 tons, yielding 1817 ozs. 13 dwts. of gold. The total receipts 3044*l.* 17*s.* 11*d.*; total payments, 2113*l.* 13*s.*: profit, 931*l.* 4*s.* 11*d.* Included in the payments is the sum of 452*l.* 0*d.* 8*d.* on new machinery account, and 600*l.* on account of year's stock of firewood. These two sums added to the above balance give 1995*l.* 5*s.* 7*d.* as the profit for the month. The loss of gold per ton of ore crushed was 4 dwts., against 3 dwts. 10 grs. the previous month. The above return is an improvement on the preceding month in most respects, being an increase in the quantity crushed of 27 tons per week, and an improvement in the yield of 25 grs. per ton, and an increase of 1*s.* 8*d.* per ton in the receipts. The month of January will show a very small return, in consequence of the machinery being idle for nearly a fortnight during the time the Clunes Company were repairing their boilers, &c. There will, therefore, be but one fortnight's return in this month's account. The quantity of quartz crushed will be more than usual for that period, as the first week included seven days' work instead of five, we having commenced the week on Wednesday morning, the 6th, instead of Thursday evening, the usual time. During this period we have crushed 958 tons of quartz, which yielded 427 ozs. 4 dwts., or, an average of 8 dwts. 22 grs. per ton. In the week ending Jan. 21 we crushed 821 tons, and from the quantity of amalgam I think it will bring up the fortnight's yield to 10 dwts. per ton.—Mine: I enclose the report of work done, as procured from the Clunes Company. A contract have just been taken for enlarging the south shaft, and sinking it to a depth to meet the 50 in the north shaft. When this is completed, and some further driving in the lower levels, the Clunes Company will, I have no doubt, be in a position to keep all our machinery fully supplied with quartz, and I hope of a remunerative quality. The stoppage of the machinery for a fortnight, and the heavy payments for stock of firewood, which up to the 9th inst. amounted to 1200*l.*, prevent my remitting anything this time, but hope to resume regular remittances next month. Our outlay on new machinery account has been heavy, but will entirely cease in another fortnight. I have been disappointed in not getting the new stamps to work. I quite expected they would have earned some money before this.

SCOTTISH AUSTRALIAN.—At Cadiangullong (Capt. Holman reports) in the past month a shaft has been sunk 6 fms. through alluvium and conglomerate, and a cross-cut driven from it in the rock of 7 fms., with the object of searching for one of the lodes now being developed in West Cadia Mine. Another shaft is in course of sinking to extend the search, together employing four men. In prosecuting the surface operations at Canobias Mine there were raised from the stopes during the month 174¼ tons of ore of low average percentage, yielding on assay 7¼ tons of fine copper Capt. Holman observes—The stopes are about 40 ft. wide, fully two-thirds of the produce of which is similar to the class sampled this month. So little, however, has yet been done in stoping, that it is very probable richer deposits of ores will be met in extending the same—in fact, a higher class of ores is known to exist in the deepest part of the stopes, which will be operated on shortly. It will first be necessary to uncover the upper layer of ores, occupying a few days only, when several parts of the stope will be operated on together, and in the ensuing month a large quantity of the general average of the ores will be sampled. The engine-shaft has resumed sinking, and the south wall of the lode having apparently a gentle underlie southward, it is expected the shaft will enter it at 7 to 10 fms. below the horizon of the stopes. From the several shafts and stopes at West Cadia Mine there were raised during the month 98½ tons of ores (of slighly lower average percentage for copper than those of the preceeding month), yielding on assay 10½ tons of fine copper. The directors have received advice of shipment to London of a further quantity of 15 tons of fine copper. There was metal at the works in different stages of smelting, sufficient to make up 15¼ tons of fine copper, to be completed early in February; in addition to this, there was a stock there of 488 tons of copper ores.—Mr. Morehead, the superintendent, who had just returned from a visit to the Lampton Colliery, reports—The pit continues to produce coal of very excellent quality. We have the satisfaction, too, of receiving favourable reports of it from the various quarters to which it has been sent; some of these reports we have in writing, and we expect to receive more in the same form; and by the next mail I shall probably forward, for the satisfaction of the board, copies of various such reports, which may besides be of service to us, by being laid before owners or charterers of vessels coming out to this quarter, with instructions after discharging their outward cargo to load Australian coal for some of the eastern or other ports. In the meantime there was still a considerable amount of competition among the several coal producers in the colony.

FORTUNE COPPER (Western Australia).—Mr. L. Lawson (Fremantle, Jan. 25) states:—The quantity of copper ore at the bay is 180 tons, and as there is no vessel on the berth direct for your port, I am making a shipment of about 136 tons, per *Kestrel, via* Sydney, bills of lading of which shall be forwarded by next mail. There will be a saving of at least 10*s.* per ton in the freight to London by this route. Capt. Penberthy reports, under date of the 29th December:—The end driving south of the old working shaft, at the 40, is working with six men, at 12*l.* 10*s.* per fm. We shall begin to stope the back behind this end to-day, with two men, at 5*l.* 5*s.* per fm.; lode 3 feet wide, producing 3 tons of copper ore per fathom. The 30 north-east winze is working with two men; lode 18 in. wide, producing 1¼ ton of copper ore per fm. The stope in back of the 30, on the cross-course south-west of Samson's winze, is working with two men; lode 3 ft. wide, producing 3¼ tons of copper and lead ore per fathom. The stope in back of the 30, south-west of shaft on the cross-course, is working with two men, at 4*l.* 7*s.* 6*d.* per fm.; lode 2¼ ft. wide, producing 1¼ ton of copper ore per fathom. The stope in bottom of the 20, north-east of Samson's winze, is working with four men, at 4*l.* 7*s.* 6*d.* per fm.; lode 4 ft. wide, producing 4¼ tons of copper and lead ore per fm. The ore raised and dressed this month is 25 tons of copper and 30 tons of lead.

YUDANAMUTANA COPPER MINING COMPANY OF SOUTH AUSTRALIA.

The second annual general meeting of proprietors was held at the London Tavern, on March 10,—Mr. HENRY HILLS in the chair.

The MANAGER having read the notice convening the meeting,

The report of the directors was submitted, which stated that the financial position of the company, as exhibited in the annexed accounts, shows a cash balance amounting to 5574*l.* 14*s.* 4*d.* Bills of lading of ore have been received, representing about 610 tons (of which 234 tons, per *Orient*, have arrived), estimated to produce 18,300*l.* The ore raised and prepared for carting and smelting at the mines is valued at 47,066*l.*, after deducting smelting charges, cartage, and freight; these items make a total available asset of 70,940*l.*, against a liability of 9683*l.* 15*s.* 4*d.* The gross excess of assets on general balance-sheet is 159,681*l.* 19*s.* This does not take into account the increased value of the property of the company since it was first opened by the working operations of the several mines, and the large quantity of ground laid bare. The present working operations at the Yudanamutana, the Wheal Gleeson, and Wheal Blinman have been energetically carried on under the superintendence of Capt. Thomas Anthony, the company's chief agent, and the directors take this opportunity of stating their conviction that he has in the short space of 18 months opened these mines in a miner-like manner. This is shown by the quantity of ore raised and shipped, together with the bulk at grass, whilst the operations have been conducted with the view of developing the future productiveness of the mines rather than for temporary results. The workings at Yudanamutana and Wheal Gleeson were at the date of the last advices down to the 20 fm. level, and Wheal Blinman about 15 fathoms from surface. The captain's reports, as published monthly, have already strongly indicated the increased value and true character of the opened mines, which may now be considered permanently established. The directors also think it well to state the opinion of their agents, that many of the unworked mineral sections held by this company are also likely to turn out mines of great value. The machinery on the mines is working most satisfactorily, and labour continues abundant. The traction-engines had not at the date of the last advices arrived at the mines, but their working appears satisfactory. In the meantime, the cartage from the Blinman Mine by ordinary means of transit is likely to be brought down from 4*l.* to 3*l.* per ton, while the reduction of large quantities of ore into regulus will necessarily still further lessen the expenditure for cartage. One smelting furnace at Wheal Blinman was at the date of the last advices nearly completed, three other furnaces are in course of erection, and the directors contemplate the construction of similar works at the Yudanamutana Mine.

The CHAIRMAN said the report and accounts contained all the information which the directors had to submit to the proprietors, but he might state that the first portion of the 233 tons of ore, ex *Orient*, comprising 133 tons, had arrived at Swansea, which had yielded upon assay an average of 31½ per cent. of copper. This portion consisted principally of unbagged ore, and, therefore, it was expected that the remaining portion would be of even a better percentage. Two other vessels were overdue, so that they might arrive any day. The ore at the mine, which had been valued at 47,066*l.*, did not embrace the ore in sight—which was a considerable quantity—but merely such ore as had been raised to the surface. (Hear, hear.) The advices extended up to the end of October, since which the directors had not received any particulars as to the quantity of ore raised, with the exception of 116 tons of first-class from the Blinman Mine, and 111 tons from the Yudanamutana Mine, but in raising that quantity of first-class ore a large quantity of second-class ore must also have been raised, for which no credit had been taken in the accounts rendered. There was an item in [illegible] onial balance-sheet

of 2341*l.*, the estimated value of supplies in transit, but that did not appear in the accounts in the hands of the proprietors, inasmuch as no voucher for it had yet arrived in London. The same remark applied to an item of 1109*l.*, for additions to the traction-engine plant, that had not been credited for. The excess of assets over liabilities was 159,681*l.*, which, after deducting the whole of the capital stock—135,000*l.*—showed a profit of 24,681*l.*, equal to a dividend of 11s. per share, in addition to the 5s. per share already paid, after deducting all expenses and the large outlay made in the development of the mines. (Hear, hear.) He had to congratulate the proprietors upon possessing such an efficient agent as Captain Anthony, for to him the greatest credit was due for the skilful and energetic manner in which he had developed the mines. Considering the difficulties against which he had had to contend, and seeing that in the short period of 18 months 6419 tons of ore had been raised, it could not be gainsaid that Capt. Anthony had been as diligent as he had unquestionably been successful in his endeavours. As regards the company's property, he might state that it consisted of 13 sections, each of which comprised an area of 80 acres. Of these 13 sections there were only at present at work—the Yudanamutana, Wheal Gleeson, and Wheal Blinman. Upon two of the other sections trials had been made, and so far as they had gone very favourable results had been realised. As regards the traction-engines, they arrived in the colony in September. The road had been made good for 35 miles, and the engines had reached Depôt Creek. According to the December advices, further progress had been made, and the directors hoped ere long to learn that they had arrived at the Blinman Mine. As regarded the smelting furnaces, from which great results were expected, at the date of the last advices one was all but completed; others were in course of erection, and the directors hoped to learn by the next advices that one was in active operation; the others would shortly follow. When the four furnaces were completed the directors hoped to be able to reduce 120 tons of ore per week into 30 or 40 tons of regulus, containing 50 to 60 per cent. of copper, or about 8000*l.* per month. (Hear, hear.) The necessary fuel (wood) was cheap, being delivered on the mine for 5s. per ton. The Colonial Government had voted 1000*l.* towards making the road up to the mines; in addition to which the directors had authorised a further expenditure of 500*l.*, which it was expected would be sufficient to make the road, at all events, up to the Blinman. At date of the last advices the staff employed at the Yudanamutana Mine was 76, and 125 at the Blinman Mine. He concluded by moving the adoption of the report and accounts.

Captain G. HUMBY seconded the proposition.

A SHAREHOLDER required some information with regard to the item of 80000*l.* for supplies.——The CHAIRMAN said supplies consisted generally of clothing, provisions, and all kinds of necessaries for the large body of men employed at the mines. The company were compelled to keep on hand a large stock of supplies, in order to meet the requirements of their labourers. In the November cost-sheet the expenditure at the Blinman Mine was 1412*l.*, of which 893*l.* was paid in these supplies.

Mr. TOKEN had understood that the disposal of these supplies bore a profit to the company.——The CHAIRMAN said that 10 per cent. was made over and above the cost of the supplies to the company.

Mr. G. SNOW was about to address the meeting, when he was informed that the shares hitherto in his name had been re-transferred, and that, therefore, he was not entitled to be present.——Mr. SNOW said there were ten shares that were transferred a week since. ("Oh, oh!") All he wished to know was why the 619 tons of ore had been valued at 30*l.* per ton, when the last sale realised only 21*l.* per ton? ("No, no.") [A Voice: "The last ore realised 28*l.* per ton."]——Mr. SNOW: But there was nothing put by for the cartage.——The MANAGER: And for the simple reason that all the cartage was paid for before the ore arrived in this country. (Hear, hear.) As regards the ore, which had been valued at 30*l.* per ton, assuming that the standard for copper ore was 20s. per unit, when the ore estimated at 30*l.* per ton was sold it would realise 31*l.* per ton.——The CHAIRMAN said that an offer had actually been made to the directors of 20s. per unit for the whole cargo of ore per the *Orient*. (Hear, hear.)

Mr. TRENOW said, although he had had large experience in mining, he did not know another instance where a mineral property had either been brought into such a position, or had produced such extraordinary results, in the short space of 18 months, and there could be no doubt that this company had before it a long and prosperous career. (Hear, hear.) He supposed the shareholders might look forward to a good dividend being declared in June or July.

The CHAIRMAN said the directors hoped for great results from the smelting of the ore into regulus. There was a considerable quantity of ore which must be reduced into regulus before it could be turned into money. It was proposed to smelt all ore under 20 per cent., so as to lessen the cost of cartage. It was also proposed to erect smelting furnaces at the Yudanamutana Mine as soon as the four were erected at Blinman.

Mr. FARR enquired if it were true that an offer had been made to the directors for the purchase of any portion of the company's property?——The CHAIRMAN said that a *bona fide* offer had been made by responsible parties for the purchase of Blinman for the sum of 90,000*l.*; it originally cost the company 6000*l.* (A Voice: Where is "Veritas?")

Mr. FARR said that Mr. "Veritas," whoever he might be, had been particularly attentive to him (Mr. Farr) in favouring him with his anonymous scribblings. Mr. "Veritas" was, unquestionably, "the father of lies." (Hear, hear.)——The CHAIRMAN said the offer for the purchase of the Blinman Mine was still open.——Mr. FARR enquired the reason the directors had not accepted that offer?——The CHAIRMAN said the offer emanated from parties who had ample means of ascertaining the intrinsic value of the property, and the directors had reason to suppose that such an offer would not have come from such a quarter unless the actual value of the mine was considerably larger than the sum offered. (Hear, hear.)

M. FARR said he had had information from the mines of a very satisfactory character, and which would prove to him that the directors might have said a great deal more in their report. (Hear, hear.) He was somewhat surprised that the directors had not given some account of the ore raised between October and the present time. It would enlighten Mr. "Veritas."——The MANAGER said that no value for ore was taken or put upon paper but what the directors had documents to prove. (Hear, hear.)

Mr. J. SALMON said, when he received one of the anonymous circulars, signed "Veritas," the first question he put to himself was—what could induce any man, be he shareholder or otherwise, to incur the expense of printing circulars, and paying the postage for their delivery to a large number of shareholders? All persons were aware that such trouble was not often taken disinterestedly, and that induced him (Mr. Salmon) to enquire whether there was a converse to it, and to discover whether it was not the work of some of those people who were known upon the Stock Exchange as "bears." After due investigation, so confirmed did he become in his opinion that these anonymous scribblers were unscrupulous "bears," that, although he (Mr. Salmon) already held a considerable number of shares, he purchased 50 more; but, as he had expected, when the account-day came the shares were not delivered; but a letter from his broker informed him that there was a scarcity of shares, and that if he (Mr. Salmon) allowed them to be carried over to next account 3d. per share would be paid for the loan. After some time he succeeded in getting his fifty shares. Therefore the object of Mr. "Veritas" could easily be understood. The fact was, Mr. "Veritas" had oversold himself, and finding the shares exceedingly scarce, he resorted to the most despicable means to induce *bona fide* shareholders to dispose of their interest. (Hear, hear.) There was one matter upon which he must congratulate his fellow-proprietors, and that was the addition to the direction of the name of Mr. Martin. (Hear, hear.) He believed that Mr. Martin still held 10,000 shares in this company, and that since the last meeting he had considerably increased his interest. (Hear, hear.) Mr. Martin was personally acquainted with each of the company's mines. In his (Mr. Salmon's) opinion, the great interest which Mr. Martin held in the company was a substantial guarantee to the shareholders that the statments of Mr. "Veritas" were an unadulterated tissue of falsehoods. (Hear, hear.) If this company were what Mr. "Veritas" stated it to be, was it not reasonable to suppose that Mr. Martin would have disposed of his interest, whereas the fact was Mr. Martin had increased it, and since the last meeting. Now, as regards the balance-sheet, he had no doubt that every shareholder would have seen that Mr. "Veritas" was not very particular about his figures,—of course, it would not answer his purpose to be particular. The fact was, Mr. "Veritas" had nothing to lose, but everything to gain. Mr. "Veritas" could not get rid of this palpable fact—that the company had paid 20,000*l.*, and that in the short space of 18 months there had been raised and brought to this country about 30,000*l.* worth of ore. His (Mr. Salmon's) advice to the shareholders was to hold fast to their shares—(hear, hear.)—for if ever there was a mining company that bid fair to be highly remunerative to the shareholders, it was the Yudanamutana Company. (Hear, hear.) If Mr. "Veritas" could have substantiated one single statement he had made, he could easily have purchased five shares to have entitled him to be present upon this occasion. (Hear, hear.) As regards the traction-engines, he did not think they would be successful for the purposes for which they were sent out; but, under any circumstances, they would be worth all the money they cost the company, for they could at all times be made very useful for many purposes. He believed the smelting-works would be everything to the company, for he did not see any reason, obtaining the fuel at 5s. per ton, why they should not reduce the whole of their ore into regulus of 50 or 60 per cent. He felt confident that when these smelting furnaces were completed the future of this company would be the grandest of any in Australia, not even excepting the Burra Burra. His advice was, that the shareholders should band themselves together, and turn a deaf ear to the untruthful statements of "Veritas." (Hear, hear.)

The CHAIRMAN mentioned that some blocks of ore, between 4 and 5 tons weight, were to be seen at the London Docks. These blocks gave a very good idea of the nature of the lode from which they were taken.——Mr. O'FARRALL (who, it was subsequently stated, was not legally entitled to be present) made several statements, among others that Mr. Ayres, the secretary of the Burra Burra Company, had informed him that ore under 10 or 12 per cent. would not pay for smelting.——The MANAGER stated that Mr. Ayres' published evidence upon that point controverted that statement.

Mr. O'FARRALL was about to make some further remarks, when he was hailed by cries of "Chair, chair," "Time, time," "You are 'Veritas.'" To the latter remark Mr. O'Farrall replied by stating that he was not "Veritas;" when a shareholder remarked that "Mr. O'Farrall was uncommonly like Mr. 'Veritas's' brother." (Laughter.) Having made several unsuccessful attempts to continue his remarks, Mr. O'Farrall at length resumed his seat, apparently not very well pleased at the unwelcome reception with which he had been met.

The CHAIRMAN having stated that Mr. Martin, who attended under very distressing circumstances, would address the meeting.——Mr. O'FARRALL again rose, and stated that he wished to mention "something that was not a fact," which provoked great merriment, but the meeting refused to hear him.——Mr. MARTIN (the newly-appointed director) stated that, owing to a domestic affliction, he attended much against his will. He believed the report of the directors to be an honest, straightforward, and just report, and that everything that had been estimated was within its real value. As to the great value of the mines he had not the least doubt. He would ask Mr. O'Farrall how he knew that 12 per cent. ore would not pay?——Mr. O'FARRALL said from information he had received.——Mr. MARTIN would ask Mr. O'Farrall why it would not pay the company to smelt 10 per cent. ore, or even 5 per cent?——Mr. O'FARRALL said, from the great price of the cartage.

Mr. MARTIN said that the price paid by this company for cartage was no more—in fact, it was less—than that paid by the Burra Burra—the Burra Burra never paid less than the Yudanamutana was paying for cartage, but considerably more. And what was of importance, the Yudanamutana obtained fuel at 5s. per ton, while the Burra Burra were paying 18s. to 20s. per ton. He saw when upon the property that there was timber enough on the spot to last for some time, and there was, within five miles of the Blinman Mine, more timber than could possibly be required for the next 10 years; and within 15 or 20 miles there was more timber than could be consumed for very many years. (Hear, hear.) With reference to the offer which had been made for the purchase of the Blinman Mine, he was in a position to know that the offer had been made, and that if the shareholders were willing to accept it, the 90,000*l.* would be gladly paid. So far from having disposed of any of his interest, from the information he had obtained from the colony, he had increased it.

The CHAIRMAN, in reply to a question, stated that in the event of the traction-engines not answering the purposes for which they were sent out to the colony, they could always be made available for the mines as stationary engines.

Mr. T. G. TAYLOR attempted to address the meeting, upon which the solicitor of the company, quoting from the Articles of Association, stated that no person was entitled to be present or vote until he should have possessed his shares three calendar months. It was stated that Mr. Taylor was not even a registered shareholder.

The motion for the adoption of the report and balance-sheet was then put, and carried unanimously.——The election of Mr. Martin as a director of the company was unanimously confirmed.

Mr. J. SALMON could not refrain from observing that there were only two opponents, in the room full of shareholders, to the adoption of the report—one who had stated, or was about to state, a something that he admitted was not a fact; and the other was a person who had no legal right to be present, but who had interfered with the progress of the business of the day. The person who avowed he was going to state something that was not a fact had come with a brief, evidently prepared by somebody—[A Voice: "Perhaps, Mr. Paxton," or "Veritas."]—he (Hr. Salmon) would not say by whom, but a brief prepared by somebody, and upon that brief he proceeded to make certain statements. He (Mr. Salmon) did not expect that *bona fide* shareholders would come armed with a brief, but he was glad to see that out of 600 or 700 shareholders the only opponents were those who had no right to be present.

The auditors were re-appointed.

A cordial vote of thanks to the Chairman and directors for the able and efficient way in which they had conducted the affairs of the company having been passed, the proceedings terminated.

ON THE MODES OF TRAVELLING IN AND OUT OF MINES

[Notes from a Lecture delivered by Prof. W. SMYTH, at the Royal School of Mines.]

The simplest mining operations are those confined to levels where no climbing apparatus is required, but where the operations are more extended, and shafts are sunk, some means are necessary to enable the miners to ascend and descend to their work. In speaking of shafts, we must distinguish between those that are perpendicular and those that are inclined. Some of the modes for travelling down shafts are of a very rude and rough character, as that by stebbles, a method still to be seen in use in the North of England. We have examples of it in some mines of Yorkshire, where the shafts being small, and generally walled, pieces of wood are driven in between the stones of the walling, and the ends of these timbers projecting form a footing for the miner as he climbs. If the shaft be in the solid rock, and not walled, thick sticks are wedged into hollows made in the rock, and serve the same purpose. The great objection to this plan is that the wooden pegs often slip out, and cause serious accidents; in fact, it is an extremely rough plan, and ought not to be permitted. Similar to this is the plan to be seen in some of our lead mines, where to both sides of the shafts, which are lined, are attached a row of whole or half timbers, the climber resting his feet alternately on either side of the shaft; this is a common devise where it is necessary to stope ground away rapidly. Both of these rough methods, however, are most objectionable, as the exercise of climbing by either is most laborious, and, moreover, dangerous.

Passing from these ruder modes of travelling in mines, we come to that by ladders, and of all forms of ladders the most unsatisfactory are those common to some mining districts in Italy and France, where they consist of a simple rod of wood, hanging loosely in the shaft, and having attached to it at right angles bars, which serve as steps. The vibration of these ladders is often very great, and the footing insecure, so that accidents frequently happen from the miners falling away. The same plan used to be common in some of the mines of the Palatinate.

The usual form of ladder is that of the German or English type. It is constructed of two cheek-pieces, with staves placed across them of wood or iron. In the German ladders the cheeks are placed at a distance of 10 or 12 inches asunder. The size of the cheek-pieces is 3 inches by 4. In Saxony the staves are of wood. In England also wooden staves are common, and are generally made of round pieces of ash, cylindrico-conical in form, and stout; they are tolerably strong, but from their size require the hand to be kept well open to obtain a firm grasp. This remark does not in any way apply to the wrought-iron or to the German staves. A very important point as regards ladders is the distance the staves shall be asunder: in some we find them 10, in others 11, and even 12 inches apart. The outside distance is 12 inches, but when so wide the fatigue in climbing is very considerable. This may not be a very important point in shallow mines, such as those of Cumberland; but when the mines are deep, the distance between the staves should never exceed 11 in. After all, however, the point of greatest importance is the way in which the ladders are placed in the shafts. Under this head it should be stated that it is most desirable to divide shafts (in which it is required to perform two sorts of work), either by brattices or by casing. To divide the shaft is, of course, unnecessary where it is used only for drawing purposes, but where it is required for pumping and travelling, and more especially where it is for travelling and drawing, it should be invariably divided by a casing—that is, by planks, 2 or 3 inches thick, nailed against cross-pieces.

In collieries, this division is of great importance for the passage of air. The brattice being there not only intended for a division, but also as a separation between two currents of air, one travelling upwards the other downwards, it is there necessary to make the casing as air-tight as possible. A division, however, should be considered essential in all mines where drawing and climbing are carried on in the same shaft. Undivided shafts used for this double purpose are more particularly objectionable; since it is necessary in such cases to cramp the ladder to the side of the shaft, which being thus placed nearly perpendicular, the labour of climbing is greatly increased. Where ladders are required for pitwork in the pumping-shafts, there should always be a casing dividing the space. In Cornish mines there is invariably a good roadway in the engine-shaft; but still it is desirable that there should always be another roadway, where there is no machinery working. First, because the men ought not to be brought into contact with the machinery, or allowed in any way to interfere with it; and, secondly, because it is well that the men should be rested by a different kind of labour in climbing. This is impossible where the roadway is in the engine-shaft; but if there be another road up through the winzes of the mine, the miners are rested by travelling horizontally from one winze to another.

If you have a whole shaft for the sole purpose of a road-way, the ladders should be placed in the best possible way. It is universally acknowledged that in accomplishing this the ladders should be inclined at such an angle that the centre of gravity of the man's body shall fall within the position of his feet. The ladders should be supported on sollars, or wooden stages, resting in the shaft on cross-pieces of timber. In the sollar there is a manhole, and through the hole protrudes the top of the ladder, placed in a sloping position, at a convenient angle, its foot resting upon another sollar. The length of the ladder in Cornish mines is usually 9 feet. Of course, it is sometimes necessary to place the ladder perpendicularly in the shaft; but this is, if possible, to be avoided, as the pull on the vital parts is most injurious to the climber when the ladders are so placed. Sollers are, again, most necessary as resting-places for the men, and as preventives against falling stones, &c.—in fact, are indispensable where security is looked to.

In collieries we seldom find ladders, as the men are in those mines lifted up and down by ropes and other machinery. In sinking sumps, and in other places, where a short ladder is required, chain-ladders are commonly used; they are formed of two cheeks of chain, with wrought-iron staves. They hang loosely in the shaft, and, of course, vertically; but if attached at either end, and gently sloped, they form most convenient ladders. When a shaft is inclined, at a moderate angle, the ladders may be clamped to its side, but here also sollars should be put in, to rest the men. These sollars have still an additional advantage—that when supplied with trap-doors they may be used to direct the current of air in the shaft in any required direction. When we compare the casualties in mines, we shall find that by far the larger proportion take place in the shafts, and in a fair comparison of all the accidents in lifting the men, we shall see that the casualties are less by ladders than by chains or ropes. Against this we must, however, place the great loss of time and labour wasted in climbing. The loss of time is very great, as in some of our deep Cornish mines the men take from one to two hours in descending to and ascending from their work, and this time, of course, has to be deducted from their day's labour. This consideration led to the adoption of the plan of sending down the miners by ropes or chains, a method universally employed in all our collieries. In metalliferous mines, however, it is only short distances that men ever descend by ropes. They make a loop at the end of the rope, into which they place one foot, and, catching hold of the rope above, are lowered away. This is a most disagreeable mode of descending, especially where the shaft is at all inclined. Almost the same plan used to be adopted in our collieries, and is still to be seen in Lincolnshire and Shropshire, where the men hang on in a cluster to the chain or rope, like a bunch of grapes, until they are lowered to the required depth. The general adoption of cages in our collieries has done away with this, and the same apparatus there used for the drawing of stuff is also used for drawing the men. A vast number of accidents take place in drawing by chains and ropes, besides which must be considered the great loss of time.

To illustrate this remark, let us take an instance. By law, when men are lowered by a rope in collieries, eight is the maximum number allowed to go at one time. Now, if there are 500 men employed in one colliery, and eight go down at a time, it will take sixty-three journeys of the rope to land all the men in the mine, and if each journey takes three minutes, the time required for the whole lot to be lowered will be three hours nine minutes. Of course this is, to a certain extent, variable with the rate of and facility for winding. We have here, then, a great loss of time in sending men down by cages. On the other hand, in sending men down by ladders, we have, independently of the question of humanity (for miners who climb are peculiarly liable to chest diseases and premature death), the question of economy. Now, in the metalliferous districts ropes and chains are not applicable for drawing the men; firstly, because the shafts in such mines are commonly inclined, and often in varying directions, and are not lined as in collieries; secondly, whilst in collieries the men require to be landed all, more or less, at one depth, in metalliferous mines they require to descend to varying depths. The adaptation of the system of cages to metalliferous mines has been attempted in Cornwall, and what are called safety-skips have been devised, such as that at South Frances, which is a miserable machine, from the uncomfortable form of the skip.

Under these circumstances it was that an old miner in the Hartz, in the year 1832, observing the reciprocal action of the pump-rods at the bottom of the mine, thought he might apply it to the raising of the men. With this idea he drove some nails into the rod, and proving the truth of his surmise, obtained permission to adapt steps to the rods, by which the men were allowed to travel, and thus originated the fahrkunst, or man-engine. The machine in the Hartz consists of a series of rods, attached to the pump-rods, and to which are fixed steps of wood, 1 foot square, supported by brackets of iron. About 4 feet above the footboard there is placed a rod of iron, some 18 inches long, which serves as a handle for the men to catch hold of whilst riding on the footboard.

Within three or four years of the same time, curiously enough, and it would appear ignorant of what was doing in the Hartz, Mr. Charles Fox offered a reward in Cornwall for a machine for lifting the men from the mines, and the result of this offer was the machine invented by Mr. Loam, and afterwards erected, principally by subsidies from the Royal Cornwall Polytechnic Society, in Tresavean Mine, in 1842. This machine was more perfect than the German form. There was, however, nothing new in it, but the Cornish engineers certainly deserve great praise for the introduction and invention of a somewhat similar machine, in which the single rod was substituted for the double rod, the original form of the man-engine at Tresavean, two rods oscillating reciprocally. This new form has been put up in several Cornish mines, and, curiously enough, in some of the most interesting mines of the West, as Fowey Consols, the oldest copper mine in Cornwall. The objections to the double-rod man-engine are, that it is more expensive than the single rod type; that it occupies more space; that it is less safe, since stepping on to a moving platform must be more dangerous than stepping on to a fixed one; and, lastly that the travelling is more complicated. In the single-rod man-engine the rod is furnished with platforms 12 feet apart, while a series of sollars are placed a similar distance apart in the shaft, on each side of the rod, in such a position as to correspond with the levels of the platform at the end of each stroke. The miner on leaving the platform, at the end of the up or down stroke, waits on the sollar till the next up or down platform comes to him. This type of man-engine is a decided improvement on the old double-rod type, and all the later engines erected in Cornwall have been of this form. The motive-power most applicable to the man-engine is the rotary engine. When the man-engine is nicely balanced, and once in motion, hardly any force is required to keep it working. Prof. Smyth concluded his remarks by mentioning the cheaper form of man-engine as used in Germany, which, although not so strong in form as our Cornish machines, is equally as safe and useful.

PREVENTION OF STEAM-BOILER EXPLOSIONS.—At the ordinary monthly meeting of the Manchester Association for the Prevention of Steam-Boiler Explosions (Mr. W. Fairbairn in the chair), the report of the chief engineer, Mr. L. E. Fletcher, stated that during January and February the ordinary visits of inspection had been made, 2 boilers inspected by hydraulic pressure, and 307 defects discovered in the boilers examined, 10 of which were dangerous. During the period included in the report 5 explosions occurred, resulting in the death of 15 persons, and injury of 12 others; yet it is found, with regard to the 4 the details of which have been ascertained, that they were not under the inspection of the association. The utility of the association may be judged of by considering the cause of the Aberamas explosion, where 13 lives were lost: it was stated at the inquest, after a searching professional examination had been made, that the iron was so much corroded in places that the boilers could not have been safely worked at a pressure of 20 lbs. per square inch; whereas at the time of the explosion the pressure was not less than 40 lbs. It was further remarked "that in the majority of instances these accidents have proceeded from wear and neglect with respect to repairs." The professional witnesses examined asserted "that the explosion was solely attributable to the corrosion of the plates insides," that "there had been no deficiency of water," and that "the corrosive defects could have been found out if the boilers had been properly cleaned and examined." Such associations as the Manchester Association for the Prevention of Steam-Boiler Explosions affords a ready and economic means of ensuring the systematic and periodical examination of boilers, and as it is now beginning to be very strongly remarked that "Government inspection and interference are to be deprecated, yet, as these accidents have of late been frequent, and attended with much loss of life, the Secretary of State would do good service by directing, in every case of boiler explosion, involving the loss of life or serious bodily injury, a proper investigation to be made as to the causes, and an annual report to be prepared of all such accidents," it is certain that unless boiler owners generally avail themselves of the advantages which private and mutual boiler inspection associations offer them, they will, ere long, have to submit to Government inspection. Notice has already been given in the House of Commons by Mr. Ferrand of the intention to bring in a bill for compensating the families of persons killed by boiler explosions through the neglect or fault of the owners, and, no doubt, more stringent measures will shortly follow. The inspections of private boiler associations would render all such measures unnecessary.

PROVINCIAL INSURANCE COMPANY—THE GOVERNMENT ANNUITIES BILL.—Much satisfaction was expressed at the annual meeting of this company at the result of the year's operations. It appears that in the Fire department 9266 new policies were issued, the premium on which amounted to 24,865*l.* 16s. 8d., raising the fire income for the year to 50,124*l.* 13s.; the excess of premium over losses being 30,584*l.* 12s. 6d. In the Life department the premium on the new policies were 6063*l.* 14s. 11d., raising the life income for the year to 25,396*l.* 11s. 1d. The claims upon life policies amounted to 6035*l.* 8s. During the year 231 new agencies have been appointed in the United Kingdom. A dividend and bonuses, equal together to 20 per cent. upon the paid-up capital, was declared. With reference to the "Government Annuities Bill," the Rev. David Williams, of Nannerch, observed that he was glad to find that the company did not join in the agitation which was now being got up by many life insurance companies, against what he considered a wise and considerate measure for the poor—the plan which the Chancellor of the Exchequer had now before the House of Commons. He believed that that bill, enabling the poor man to deposit his savings in the Post-office Savings' Bank, or rather to purchase a Government annuity for himself in old age, would never injure a company of this kind; and he was quite sure that if the Chancellor of the Exchequer has many claims upon their gratitude for the many benefits which he had conferred upon the working classes, this first act of his to ameliorate the condition of the labouring population was one of the crowning glories of his life. The interest of the life insurance companies would not suffer by this bill, because it only provided for the deposit of the savings of people who would not be able to save enough to make it worth their while to insure their lives at the Provincial or any kindred office. There was one interest, however, which he felt would suffer by the introduction of this bill, and was not at all sorry to find that that interest would suffer. He believed the public-house interest would suffer by the introduction of that bill. If it passed into an Act of Parliament, he believed it would inflict a fatal blow upon those bodies which were called by some strange perversion of language "benefit" clubs, throughout the length and breadth of the land. He believed that if the poor man were enabled to deposit his money in a Government security, instead of taking to public-house clubs, a great boon would be conferred upon the working classes of the country. The retiring officers were re-elected, and the Chairman (Mr. T. Barnes, M.P.), in acknowledging the usual complimentary vote, observed that the company had been going on well, and he believed that with the same principles and practices on the part of the directors, it would continue to prosper in the future, and he should live to see the day when the company would rank amongst the most important companies in the land.

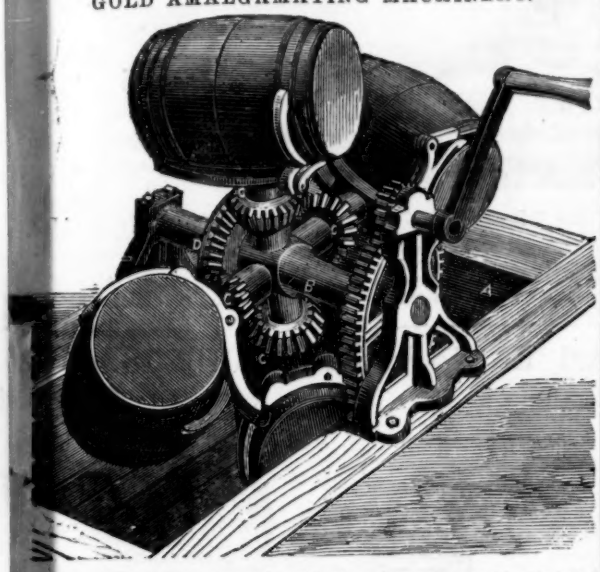
ADVANTAGES OF LIFE ASSURANCE.—In the Journal of January 9 we noticed the issue of a new annual, entitled "The Railway, Banking, Insurance, and Commercial Almanac," and stated that it was intended to form an annual epitome of the progress of the material interests of the country, by supplying a series of ably-written articles upon the several branches of our national industry, and as the claims and advantages of life assurance companies has now been brought prominently under consideration by the introduction into Parliament of a Bill materially interfering with their privileges, the almanac may again be alluded to as containing a very interesting article—Life Assurance: its uses and capabilities. He first alludes to the remark of a deceased political economist, that "If life assurance were universal there would be no workhouses," and carefully points out the shortcomings of life assurance societies in their earlier existence, which led to public confidence in them being, to an extent, shaken, and explains the course which has been adopted to render them that which they are at present acknowledged to be, thoroughly reliable institutions. As we have previously stated, the almanac is edited by Mr. W. P. Smith, of the *Railway Record*, and published at the office of that paper, and it forms one of the most valuable commercial annuals yet issued.

Mr. C. Hutton Dowling is preparing for immediate publication a complete series of tables for facilitating the ready conversion of British measures and weights into those of the metric system, and *vice versa*. Such a work cannot fail to render important service to engineers, architects, merchants, and all who are engaged with those countries in manufacturing, mechanical, or commercial transactions. The tables about to be offered to the public were, in fact, originally calculated by the author for his professional use; so great, however, has been the assistance afforded from them that he has been induced to extend them so as to form a complete collection suitable to all branches of foreign commerce. The work will be published by Messrs. Lockwood and Co., Stationers Hall-court, E.C.

"THE BATTLE OF THE STANDARDS."—An interesting little volume, bearing this title, has just been issued, through Messrs. Longman, by Mr. JOHN TAYLOR, the author of "The Great Pyramid, Why was it Built?" and other works. The object of the book is to prevent the general introduction into this country of the metrical system of weights and measures originated in France, and since adopted by most other European countries; the grounds upon which he contends that the present system should be maintained are, that the French standard measures are at once too large and too small, and that the present English foot approximates more closely to the measure which was, perhaps, in use amongst the Egyptians

as the time of the building of the pyramids than either of the principal measures of the metric system. Prof. De Morgan warns us not to regard the metric and the decimal systems as identical, and advocates the application of the decimal system to our present weights and measures, but surely if we are to have a change to the decimal system at all, it would be preferable to adopt a system already in use in commercial countries with which we have constant dealings, than to frame an entirely new system for ourselves, and thus cause all the inconvenience of a change without securing its advantages. Mr. Taylor indisputably proves that the length of the foot has varied in almost every country which has been mentioned in history for the last 4000 years, and that by taking the average of a certain number of these ancient feet a measure not differing much more than 1/6 inch may be obtained, whence he argues that our mathematical accuracy should not be disturbed.

GOLD AMALGAMATING MACHINERY.



The necessity for a thoroughly efficient amalgamating machine, in order to render profitable the extraction of the precious metal from the auriferous ores of Wales being generally acknowledged, and most practical men admitting that the barrel is the most economic machine that can be employed, Mr. John Walker, of Cowper-street, City-road, has adapted an apparatus, originally intended for an entirely different object, to the purpose of gold amalgamating. The great advantage of the barrel process is that you get all the amalgam, and do not waste any of the quicksilver; but when the ordinary amalgamating barrel is used a very long time is required to complete the operation, for the barrel only turning about its axis the quicksilver always keeps at the bottom, whilst the slimes containing the silver or gold merely come in contact with the quicksilver by rolling over it; this causes a considerable time to elapse before the whole of the slimes pass in contact with the mercury; and unless it does so the gold or silver is, of course, not taken up.

Mr. Walker's apparatus consists of four barrels, which may be made of any convenient size, revolving about a centre, with a kind of sun and planet motion, which ensures every portion of the ore under treatment being speedily brought into contact with the mercury. The main shaft, which is supported horizontally upon suitable framing, is provided with four cross arms, upon the ends of which bevel toothed pinions loosely revolve, the outer side of the wheels carrying the frames which support the barrels. Upon the main shaft there is also fixed tight a bevel toothed wheel, which takes into the four pinions on the cross arms already referred to.

It will readily be understood that the result of this arrangement is that each rotation of the main shaft produces not only the rolling motion of the barrel, but its rotation from end to end. The wheels can be instantly thrown in and out of gear to facilitate the empting and filling of the barrels. The machine possesses several advantages as a gold amalgamator, not the least being the extremely small amount of power required to work it. The barrels counterbalance each other to a great nicety, and by ordinary care being exercised in charging, the labour of a single man will be sufficient to produce a large amount of work. Mr. Walker has had much experience in the manufacture of mining machinery, and anticipates his present contrivance being even more successful than usual.

The precise character and advantages of the machinery will be better understood from the above diagram, in which A is a wrought-iron tank, 8 feet long, 4 feet wide, and 3 feet deep; round the top edge is riveted 3½ inch angle-iron; on the centre of each side is fixed a strong cast-iron standard, which carries a 2½ in. wrought-iron shaft, B, fixed at each end; on one end of this shaft is placed a large hollow shaft, bored out so that it may revolve freely on the fixed shaft. On the hollow shaft are four projections, which carry four spindles at right angles. On these four spindles are four pinions, C, geared into a large bevel-wheel, D, fixed by a movable clutch on the other end of the fixed shaft. On the end of the hollow shaft is fixed a spur-wheel, which is turned by a pinion, by manual or other power. On the top of each pinion is cast a strong plate, to which the barrels may be fixed. It will be obvious that when the hollow shaft is caused to revolve, each pinion receives a motion upon its own axis, and turns the barrels twice round for one revolution round the fixed shaft, so that the contents cannot fail to be thoroughly agitated, being continually thrown backwards and forwards against the sides and ends. We have examined a machine of the working size, at Mr. Walker's factory, and a working model can be seen at our office by those interested, the inspection of which, we have no hesitation in saying, will cause it to be recognised as one of the most perfect amalgamators yet introduced.

MANUFACTURE OF GAS.—A peculiar arrangement of apparatus for feeding or supplying hydro-carbon, oil, water, or other liquid to a retort for the purpose of generating gas or vapour, has been provisionally specified by Mr. J. Samuel, of Great George-street, Westminster. He forms a certain rectangular, circular, or other form of cistern for holding the liquid, and connects to this a regulating chamber or receptacle, in which he places a float with a conical spindle valve attached to its centre; this valve opens and closes the inlet aperture as the float rises and falls, admitting the liquid from the cistern to the regulating chamber, and thus keeping the liquid in the regulating chamber at a uniform level, the liquid is conducted by a pipe from the regulating chamber to a well or receptacle considerably below the bottom of the red-hot retort to which the well or receptacle is attached. The heat from the retort, and the fire acting upon the liquid in the well under and attached to the retort, generates vapour, which vapour rises and passes through the retort and becomes decomposed into a permanent gas. The liquid feed inlet from the regulating chamber to the retort is very small, but that end of the feed pipe or well nearest the retort is made large, and placed in a vertical or inclined position; after the gas has issued from the retort, it may be washed by passing it through water or other liquid, or the gas may pass direct from the retort to two gas regulators, and then to the burners for consumption. The first gas regulator regulates the pressure in the retort, and is formed like a small gas holder made to hold one foot or more of gas, and is so constructed that as it fills with gas the top of the holder receives more weight, and it gradually increases the pressure in the retort, driving the liquid further away from the red-hot part of the retort, thus making less gas; as the top of the holder falls the pressure decreases, consequently the liquid rises higher in the retort and more gas is generated. The second gas regulator is of the usual description for regulating the pressure of gas to burners; by this arrangement a large gas holder may be dispensed with. The gas generated by this process may, if required, have its illuminating power increased by mixing it at the point of combustion with the vapour from volatile hydrocarbon oils, and the small vessels placed at the different points of combustion to contain the hydrocarbon oils for carburating the gas will serve as receivers for any condensed vapour that may form in the gas pipes.

CORNISH PUMPING ENGINES.—The number of pumping engines reported for Jan. is 31. They have consumed 2269 tons of coal, and lifted 17·6 million tons of water 10 fms. high. The average duty of the whole is, therefore, 52,300,000 lbs. lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Carn Brea—76 in.	Millions	54·9
Crane—70 in.		77·7
Dolcoath—Harriett's 60 in.		52·4
Great Wheal Busy—Harvey's 85 in.		59·2
Great Work—Leeds' 60 in.		62·5
North Roskear—Doctor's 70 in.		61·6
North Wheal Crofty—Trevenson's 80 in.		53·8
West Caradon—Elliot's 50 in.		59 9
West Wheal Seton—Harvey's 85 in.		66·5
Wheal Ludcott—Willcocks' 50 in.		63·2
Wheal Margery—Welsley's 45 in.		65·0
Wheal Seton—Tilly's 70 in.		67·4
Wheal Tremayne—Michell's 60 in.		65·9

IMPROVEMENTS IN PUMPING MACHINERY.

Reference has already been made in the columns of the Journal to the improvements introduced by Mr. Delpech in the construction of pumps, which have the great recommendation of not being liable to choke, or get out of repair, and at the same time of delivering an enormous quantity of water. The new pump is distinguished from those in use, not only by the form and principle of construction, but by the remarkable effects produced. They consist of an exterior metallic envelop, cast in a single piece, and divided into two distinct parts—the cylinder in which the piston works, and the valve-box, which contains four elastic india rubber spheres, which are substituted for the ordinary valves or clacks. The cylinder case is divided by a diaphragm, and thus forms two superposed chambers, and the valve-box is divided by a vertical partition, thus forming two separate compartments, each of them in direct communication with one of the cylinder chambers. In these two compartments the four spheres are situated—two in the lower portions, in which the aspiration takes place, and two in the upper, or the evacuating portions. Whatever may be the metal of which the exterior casing is formed, the seats for the India rubber balls should be in bronze, to prevent oxidation, which the contact of the India rubber aids, and these seats, instead of being hemispherical, are by preference of such a form as shall prevent the lodgment of any foreign matters. The ball-valve of vulcanised India rubber is absolutely perfect, and is not in any way affected by corrosive or highly heated liquids; and the piston being formed of two reversed cones of flexible material, packs closely, and works almost without friction.

Another advantage claimed for this pump is that there is no dead point, since the instant one sphere falls into its seating another rises, enabling a continuous upward movement in the current of water, which much economises the power necessary for raising a given quantity of water, and it is to this continuous upward movement of the current that may be attributed the facility they possess of passing foreign matters without stopping the proper action of the pump. It is to this circumstance also that may be traced the fact that, in the dynamometrical experiments conducted under General Morin, at the Imperial Conservatory of Arts and Industry at Paris, 70 per cent. of the power employed was utilised—a result which is certified in the *proces verbal* of the experiments, and one which has not been obtained by other systems of pumps. The pumps are particularly applicable as ship-pumps, but may be readily employed for almost every other purpose to which pumps are applied, the alteration of the arrangement of the pump, so as to make it useful for the one or the other purpose, occupying but a few moments. It appears that a large number of the pumps have already been adopted in this country, and as one of them is in continuous daily use at the Crown Wharf, Great Scotland-yard, an opportunity is afforded for those interested to examine the pump in actual use, and to ascertain its merits.

NEW INVENTIONS.

PROVISIONAL PROTECTION for six months has been granted for the following—

W. E. NEWTON, Middlesex.—Improvements in the manufacture of aluminium. Jan. 30.

W. C. STOBART, Durham.—Improvements in coke-ovens. Feb. 9.

J. TOUSSAINT, Middlesex.—Improvements in the manufactnre of cement and artificial stone. Feb. 9.

[nium and other sulpho-cyanides. Feb. 9.

P. SPENCE, Lancaster.—Improvements in the manufacture of sulpho-cyanide of ammo-

R. A. BROOMAN, London.—Improvements in amalgamating and separating gold and silver from quartz and earths containing the same, and in apparatus employed therein. October 9.

LETTERS PATENT have been issued for the following:—

J. LEWIS, Manchester.—Certain improvements in machinery or apparatus for preparing and drying clay, and also in machinery to be employed in the manufacture of bricks and tiles. Sept. 2.

[therewith. Aug. 28.

J. WALLS, Lancaster.—Improvements in steam-boilers, and in apparatus connected

J. M'EWEN, Stafford.—A new or improved combined coke-oven and hot-blast oven or apparatus. Sept. 17.

W. C. PAGE, Millwall, Middlesex.—Improvements in preventing the incrustation of steam-boilers, and removing incrustation therefrom when formed. Dec. 7.

LIST OF SPECIFICATIONS published during the week:—

Preserving lead surfaces from decomposition, 1s.; traction-engines, 10d.; manufacture of iron and steel, 4d.; coating metal sheets with metals or alloys, 10d.; compositions for protecting metals and metallic articles from oxidation, &c., 4d.; treating iron ores, 4d.

L. DE FONTAINEMOREAU.

TREATING WASTE MINERAL PRODUCTS.—Mr. Charles Crockford, of the Greenfield Spelter Works, Holywell, proposes thus to convert certain waste products resulting from chemical and metallurgical operations into pigments of commercial value. In each case he employs milk of lime as a precipitant, and for the purpose of throwing down or precipitating the matter or material held in solution. The precipitate obtained in each case may be dried, or otherwise treated, so as to enable the same to be prepared ready for the market. He treats the solution of manganese obtained in the manufacture of bleaching powder with milk of lime, and obtains a precipitate applicable as a pigment. He treats the burnt sulphur stone which has been employed for acid making first with muriatic acid, either with or without the aid of heat, and precipitates the iron dissolved thereby by the aid or agency of milk of lime; the oxide thus produced may be used as a pigment. When the burnt sulphur stone contains copper, as it frequently does, he precipitates the copper from the solution before adding the milk of lime; and the copper thus obtained being a secondary product, reduces to a merely nominal cost the expense of producing the oxide of iron. He utilises the waste muriatic acid by dissolving therein waste materials from smelting works, such as lead, zinc, and copper, and precipitates the metallic oxides from this solution by the aid or agency of milk of lime, and thereby obtains pigments.

SAFETY GUARD FOR MINE SHAFTS.—An improved guard for coal, iron, and other mine shafts has been provisionally specified by Mr. J. Barton, of Alfreton. He causes the cage or chair guides to project above the ground at the mouth of the pit or other opening to be protected, and cuts a recess in, or a slot through, each guide above the ground level, such recess or slot being of such width and length that a lever may swing freely in it; this lever is suspended by a pin passed through a hole in its upper end and through the side of the slot or recess in the guide. He prolongs this slot or recess for nearly the same length below the mouth of the pit-hole or opening to be protected, and secures a lever in it by a pin passing through a hole in the lower end and through the sides of the slot or recess of the guide, so that the upper lever points downward, and the lower lever upward; each lever is bent slightly near the centre of its length, the bent portion standing slightly in advance of that side of the guide facing the pit mouth, hole, or opening to be protected. Intermediately of the levers he places a rocking lever in the slot or recess, the two ends of which lever point outward, and are prevented from falling or being forced inward by two pins passed through the guide. The axis or centre of the rocking lever is regulated as to its length by the size of the mouth of the pit hole or opening to be fenced, which is provided at the ground level with a strong fencing, to which are secured bearings to support the axis of the rocking lever. He secures near one or both ends of the axis a lever, the upper end of which (or a pin which it carries) takes into a slot on one side of a gate, whereof the upper end is provided with loops sliding on a bar, and the lower end slides in a groove in the framing, or between blocks. The width of the gate is such that it will effectually close the spaces left in the fencing round the mouth of the pit-hole, or opening; a lever at the other end of the axis moves a gate to close the space, or spaces, at the opposite side of the pit-hole or opening; the sliding or movement of the gates to open and close the spaces is effected by raising and lowering the cage or platform. The gates being opened when the cage is raised, and closed when it is lowered. As the cage is raised the upper clip forces the upper level outward and opens the gates, and on its descent the lower clip closes them. If a similar apparatus be provided at each side of the pit mouth, gates of only half the width will be required, the space being closed or opened from the centre. By a similar application of levers and gates, openings with gates lying in a horizontal position, or at a convenient angle, can be satisfactorily closed.

PREVENTING INCRUSTATION IN STEAM-BOILERS.—An invention has been provisionally specified by Mr. W. C. Page, of Millwall, the object of which is to prevent the sedimentary deposits in steam-boilers from forming a hard crust on the bottom and sides thereof, and also to remove such incrustations when formed. To this end he employs a solution prepared by heating together in an iron pot creasote (or what is commonly called dead oil, or oil of tar), or any vegetable, animal, or mineral oil, with chloride of ammonium, carbonate of soda, caustic soda, or potash, or any soluble chloride or carbonate, in the proportion of about 16 ozs. of creasote to 1 oz. of either of the alkalies mentioned. The solution thus prepared is introduced into the boiler through the feed-pipe, or otherwise. About one pint to each horse-power being sufficient for about eight weeks; at the end of this time the boiler is blown off from the bottom, and fresh solution added, after continuous working for some months, the only operation then necessary being to blow off the boiler, and remove the sediment by hand. When the incrustation had already formed, the solution is introduced into the boiler, it is then put into use for two or three weeks, and the deposit, which was hard before, can now easily be removed by hand. The composition may be made either liquid or solid.

IMPROVED CHILIAN MILL.—The advantages of the Chilian mill, as compared with other descriptions of quartz mill, are owing to the larger yield of gold; the only objection is that it is too slow in its results. The heaviest wheels used in the ordinary Chili mills weigh about 3 tons; but even that weight is not sufficient to crush the particles of quartz sufficiently fine until after the wheel has been made to pass over them several times. To accomplish the desired result at one crushing, and thus hasten the process, without requiring wheels of too unwieldy a weight to make them at all feasible, with the ordinary manner of procuring them, it is proposed to place a circular plate upon the top of these wheels, and attaching the driving power directly to this plate, which in revolving carries the wheels with it, the power being transferred through this revolving plate to the periphery of the wheels. Any desirable weight can be given to the wheels by placing weights upon the upper surface of this revolving plate.

STEEL TUBES BY COLD DRAWING.—My attention has been called to an article on the new method of producing steel and other tubes by cold drawing, which attributes to a Frenchman the introduction of this system some nine years since. I claim your indulgence, in order to correct the misapprehension to which this statement may give rise, in not distinguishing more clearly between what has been and what is now the process of manufacture. The patentees of the new machinery claim to have first applied hydraulic power to the drawing of tubes in any metal. The brass and copper tubes that have hitherto been drawn solid have been so drawn by steam power, and over a mandril the length of the tube. A method of producing tubes in which hydraulic pressure is employed was introduced some years since by a French patentee, but in this instance (the only one with which I am acquainted) a disc of metal was taken and cupped up so as to form first a saucer, then a basin, and gradually, by pressure on the bottom, a tube with one end closed; by opening this end the tube was completed. The many difficulties of this process are readily seen, and I believe it has never been made of commercial importance. By the new method eight or more hollow castings of steel, or three times as many of brass, can be drawn at once over a bulk-headed mandril, and through a die surrounding it, so as to reduce them to any degree required, improving the metal at each pass. The machine erected will draw eight 3-in. tubes in steel. The patentees claim—1. The machinery by which these tubes are produced and trued.—2. A method of cold-welding them together.—3. Of drawing tubes of any length over a mandril. (This has been tested to the extent of fifty feet in steel.)—4. Of producing tapers of any size or section. The whole by cold solid drawing. There are, of course, many small details, important in their bearings on these results, but with which I will not occupy your space, as any of your readers shall have every facility afforded them for viewing the machine in operation, on applying to the secretary of the Hydraulic Drawing Company.—G. P. HARDING: 3, Bank-buildings.—*Journal of the Society of Arts.*

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending March 13 was 10,277*l.* 14s. 1d.

PROSPER UNITED MINES.

The following special report on these mines has just been made by Capt. Nancarrow, of St. Ives Consols:—

March 1.—These mines include a large tract of ground in a stratum of killas, a little north-east of the town of Marazion, and which contains several lodes. The present operations are on lodes near a large elvan course, north of which, in the eastern part of the mines, two lodes are worked, and in the western part, one on each side.—Eastern Part: Hosking's engine-shaft is sunk on the Moor (or main) lode to the 80 fathom level, where it is cut through, and it is from 3 to 4 ft. wide, composed of quartz, mundic, and occasionally stones of copper and tin. In the level there is also a cross-cut being driven south towards Hosking's lode, and it is expected to reach it in 5 fms., or two months; and as this lode was rich in the upper levels, good results may be looked for here. The lode in the 70, east of Hosking's shaft, is from 3 to 4 ft. wide, composed of peach, spar, mundic, and a little tin; it is a strong lode, and has a very promising appearance. A winze below the 40, west of Henry's shaft (which is 120 fms. west of Hosking's), yields a little tin. The lode in the 50, west of Henry's, is poor. There are thirteen pitches working in this part of the mine, at an average tribute of 11s. 6d. in 1*l.*—Western Part: Louisa's engine-shaft is sunk to the 80. Hill's shaft is 45 fathoms west of Louisa's, and Henry's shaft is 54 fms. west of Hill's; each of these shafts is on the Moor lode. There are several pitches working in the back of the 40, 30, and 20 fm. levels, at an average tribute of about 12s. in 1*l.* The 50 is driven west of Hand's 16 fms.; the first 12 fms. from shaft is poor, the last 4 fms. the lode is improved, now in end 1½ ft. wide, worth 5*l.* per fathom. Hand's shaft is down 4 fms. below this level; the lode is unproductive. There are four pitches in the back between Hand's and Hill's shafts, at an average tribute of 8s. in 1*l.*, and five pitches between Hill's and Louisa's shafts, at an average tribute of 9s. 2d. in 1*l.* The 60 is driven 40 fms. west of Hill's, the first 7 fms. poor, the next 20 fms. worth 16*l.* to 18*l.* per fathom, the next 8 fms. poor, and the last 5 fms. worth 7*l.* per fathom for copper and tin. There are two pitches in the back at 5s. 4d., and four pitches between Hill's and Louisa's at 8s. in 1*l.* There is a great deal of ground standing in the back of this level. The 70 is driven 18 fms. west of Hill's, the lode for this length is worth for tin and copper 16*l.* per fathom; the lode in the end is split, each part nearly 2 ft. wide, worth altogether 20*l.* per fathom. The back is now begun to be worked. There is a winze sunk 9 fms. below the 60, and is 5 fms. before this end; the lode is worth for the whole depth from 10*l.* to 14*l.* per fathom. The end may be holed to this winze in two months. Hill's shaft is sunk 2 fathoms below the 70; the lode is 2 feet wide, worth 6*l.* per fathom. There are six pitches in the back, between Hill's and Louisa's, at 6s. in 1*l.*; but the ground is not worked far above the level. The 80 is driven 3 fathoms west of Louisa's, the lode is 5 feet wide, worth for copper 15*l.* per fathom. There is a winze 12 fathoms west of this end sunk 4½ fathoms below the 70; the lode for the first 3 fms. will yield 8 tons per fathom, the next fathom from 3 to 4 tons, and the lode in the bottom is squeezed by elvan, but this appears to be only temporary. The ground in the bottom of the 70 is for nearly 60 fathoms in length before this end, and is worth from 15*l.* to 18*l.* per fathom. This altogether, with the fact that each of the last two or three levels has been better than the one immediately over, speaks well for the 80 fathom level, and renders it highly probable that it will be more valuable than any yet seen in the mine. The Moor lode has not been found very good immediately east of Louisa's shaft, but 4 fathoms east of shaft, at the 70, there is a cross-cut driven north 7 fathoms through the elvan, and a very valuable discovery made on what is probably the eastern part of the Moor lode. Here 5 fathoms are driven, which have yielded 7 tons of copper ore per fathom. The lode in the east end is 5 feet wide, worth 40*l.* per fathom, and in the west end is 2 feet wide, worth 15*l.* per fathom. The lode is reached by a cross-cut in the 60, just over the east end below; in driving the 60 east some good bunches of tin ground were met with, besides copper, lead, &c., which looks very encouraging for the 70 under this ground. There is a cross-cut driving north at the 80, and will reach the lode under this discovery in the 70 in ten or twelve weeks. The alterations in the pitwork at Louisa's shaft will be nearly completed this week. There are upwards of fifty pitches being worked, by 120 to 130 men, at an average tribute (at the selling price of tin) of 8s. in 1*l.* There are 84 men on tutwork, and altogether 404 hands employed. The mine looks well in the bottom, and has greatly improved in the last few months. The present operations will give a profit of 400*l.* per month, and should the present prospects continue, the returns may shortly increase.—JOHN NANCARROW.

[At the recent meeting it was stated that the profit for January had been about 800*l.*, and that for the current quarter the profit would be full 2000*l.*]

PENDEEN CONSOLS—(*Special Report* by Capts. Charles Thomas and Son, of the Dolcoath Mine, Camborne).—March 4: We could not get below the 130, as the water was in at the bottom of the mine. We learnt from the agent that the engine-shaft was sunk 2 fms. below the 142, and that the lode contained a little tin, but was not of much value. He also informed us that the 142 was driven 41 fathoms south, and 54 fathoms north of the shaft; the lode in the south level being worth 6*l.* per fathom for 6 fathoms in length near the shaft, and for the rest of the distance small and poor—and in the north level unproductive for the first 40 fathoms, but worth 4*l.* per fathom for tin the last 14 fathoms driving. The lode to the north of the engine-shaft being generally in killas has chiefly produced copper, whilst to the south of the shaft the lode being in in granite has principally produced tin. The state of the mine will perhaps, therefore, be more clearly seen if the northern and southern levels are described separately. The 130 is driven north of shaft 59 fathoms; for the first 40 fathoms the lode was unproductive, for the last 19 fathoms it has been worth about 5*l.* per fathom, which is rather above the present value of the end. The 118 is driven 104 fathoms north of the shaft; this end had been unproductive for 40 fathoms in length, but for the last 8 fathoms the lode has been producing a little copper, worth 4*l.* to 6*l.* per fathom. The men are now preparing to take down the lode in the end; it seems to be about 2 feet wide, and will probably be found to be of about the same value. The 106 north is driven 12 fathoms farther than the 118; the lode in the end, and for the last 10 fathoms, is small and poor. The 94 is driven 87 fathoms north of the shaft; the lode is unproductive, and the end is suspended. The 82 is driven 240 fathoms north of the shaft, more than 100 fms. under the sea; the lode has been poor for the last 150 fathoms, and the end is suspended for the present, as the agents expect that they are getting near an east and west lode, from which, if intersected, they fear an increase of water. Most of the copper ore ground which was discovered in the upper levels is taken away, and as the ends are comparatively poor, and the bottom end (the 142) being in the granite, and producing tin instead of copper, as above, it is evident that the copper samplings will be likely soon to decrease. We now proceed to describe the levels to the south of engine-shaft. The 130 is driven south of the shaft 64 fathoms. For the first 40 fathoms the lode was unproductive, for the next 12 fathoms it was worth from 10*l.* to 20*l.*, and in some places 40*l.* per fathom, or probably worth 20*l.* per fathom on an average for 12 fms. in length; for the last 12 fms. it has been worth on an average about 5*l.* per fathom, which is just the present value of the end. The 118 is driven south of the shaft 75 fathoms; the lode was unproductive the first 40 fathoms, it was then worth generally from 40*l.* to 50*l.* per fathom for 25 fathoms in length, and for the last 10 fathoms it has been worth on an average about 5*l.* per fathom. The lode in the end is split into branches, producing a little tin, The 106 is driven south of the shaft 87 fathoms. Like the two levels above described, the lode was unproductive for the first 40 fms.; the remainder of the level has generally been worth from 4*l.* to 5*l.* per fathom. The lode is at present disordered by a slide, and is not of much value. The 94 is driven 59 fathoms south of shaft; the lode has produced a little tin, but not enough to pay the cost of working. The 82 is driven south of the shaft 58 fathoms, the 70 fm. level 42 fathoms, and the adit 112 fathoms; nothing of value has been discovered in either of these levels, and the lode is generally small. It will be seen by the above report that the lode in the lower levels has began to produce tin at about 40 fathoms to the south of the engine-shaft, and that the richest lode was in the 118 for about 25 fms. in length. The 106 was only worth 4*l.* to 6*l.* per fathom over this place, whilst the 130 was worth about 20*l.* per fathom, instead of 40*l.* or 50*l.* in the 118, and for 12 fms. in length instead of 25 fathoms. The best of the lode from the 118 to the 130 is worked away for 12 fathoms in length, but there is a piece of good tin ground still standing in the bottom of the 118 for about 12 fathoms in length. The back of the 118 has been worked for 3 fathoms high, where the lode is worth about 10*l.* per fathom; the lode here might be expected to fall off in value, the 106, as before remarked, only having been worth 4*l.* to 6*l.* per fathom. The lode below the 130, under the good tin ground, now remains to be proved, and a winze should be sunk under that level, and and the 142 driven south as soon as practicable. The 142 end is just at the place where the upper levels entered the tin ground, and the discovery of a good lode here, or otherwise, will, of course, make a considerable difference to the value and prospects of the mine. With the exception of the bunch of tin above referred to, the remainder of the tin ground as yet discovered in the 106, and below, is of much the same general value, varying from 3*l.* to 6*l.* or 7*l.* per fathom, but, probably, worth on an average about 5*l.* per fathom. The total reserves of tin now laid open in the mine, above the 130, I estimate to be worth about 6000*l.* The lode below the 130 will be proved when the 142 is driven south underneath it. There are several hundreds of tons of unstamped tinstuff still lying at surface, the value of which cannot be exactly ascertained without having several samples of the same assayed. During the next few months, whilst the tinstuff now at surface is being stamped, and by breaking the best of the tin ground still standing in the back and bottom of the 118, a profit may probably be made of 200*l.* or 300*l.* per month, but unless ground can be discovered of greater value than 5*l.* per fm., I cannot see how that profit can be continued. I think the cost of breaking, drawing, stamping, dressing, and preparing the tin for market will not be less than 3*l.* 10s. per fathom, so that after allowing for the other necessary expenses, such as pumping water, driving levels, &c., it seems evident little or no profit can be made, unless more valuable ground should be discovered, or unless a very large quantity be broken. There is, however, a large extent of unexplored ground to the southward, and as the levels are continued in that direction other bunches of richer tin ground, similar to that met with in the 118, may not unreasonably be looked for. If the lode should prove to be productive as the levels are driven south another shaft will be desirable, and after a time almost necessary to the proper and economical working of the mine; it is not, however, necessary at present, nor would it probably be advisable to sink a new shaft until the mine is further explored. With the present machinery and shaft stuff enough can probably be drawn to supply from 50 to 60 heads, but the stamping-engine is of sufficient power to work 100 heads if they should be required, although 32 only are now working. The pumping-engine is a 24-inch cylinder, working 5-inch plungers. Owing to the increase of water, they are about to put in 6-inch plungers instead of 5-inch, and when this is done the engine will be fairly loaded; by forcing the engine a little, however, it will probably be possible to sink 20 fathoms deeper.

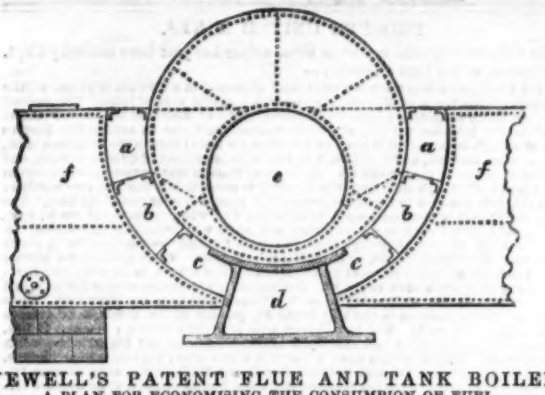
PRICES OF MATERIALS,

As charged at GURLYN MINE in the following months:—

Description.	Aug.	Sept.	Oct.	Nov.	Dec.
Engine coal ..... per ton	11s. 6d.	11s. 6d.	12s. 0d.	12s. 0d.	12s. 6d.
Cardiff coal ..... „	18 4	18 4	18 4	18 4	18 4
Timber (balk) ..... per foot	0 7½	0 7½	0 9	0 9	0 8½
„ (pine) ..... „	—	1 3½	—	—	—
„ (Baltic rod) ..... „	—	1 6	—	—	—
Iron (common) ..... per cwt.	—	—	—	—	9 6
„ (best) ..... „	—	10 0	11 0	—	11 6
„ (hoop) ..... „	12 0	—	—	—	14 0
Steel (cast borer) ..... „	—	45 0	—	—	—
„ (blister) ..... „	—	—	—	—	50 0
Shovels (steel) ..... „	48 0	—	48 0	—	—
Chain ¾-in. ..... „	—	24 6	—	—	—
Lead (sheet) ..... „	—	32 0	—	—	—
„ (red) ..... „	—	—	—	34 0	—
Nails (patent 4-in.) ..... „	—	19 9	—	—	—
Hemp ..... per lb.	—	—	—	0 5½	—
White yarn ..... „	—	—	0 6	—	—
Tallow ..... per cwt.	55 0	—	—	55 0	—
Grease (antifriction) ..... „	—	26 0	—	26 0	—
Oil (olive) ..... „	5 6	—	5 6	5 9	5 6
Powder ..... per 100 lbs.	46 0	—	46 0	—	46 0
Candles ..... per doz.	5 4	—	5 6	5 6	5 3
Cans ..... „	—	6 0	—	—	—
Hilts ..... „	—	2 0	—	1 9	1 9

At the PROVIDENCE MINES, Main Colliery Coals were charged in November 19s. 10d., and in December 11s. 4d. per ton.

PATENT FLUE AND TANK BOILER.



JEWELL'S PATENT FLUE AND TANK BOILER
A PLAN FOR ECONOMISING THE CONSUMPION OF FUEL IN STEAM BOILERS.

The advantages of this boiler, an illustrated description of which was published in the MINING JOURNAL of October 3, are obvious.

It is provided with WROUGHT IRON FLUES, conveying the fire entirely over the surface of boiler below the water line, and wholly doing away with lime coming in contact with any part of the boiler, lime having been found to destroy the boiler plates before any other parts are the worse for wear. This boiler has four additional flues to the plan at present adopted, thus affording a FAR GREATER AMOUNT of HEATING SURFACE, and MORE EFFECTUALLY CONSUMING the GASES. Between the boilers a wrought-iron tank is fixed, extending the whole length of the boilers, for containing water for feed; this water will pass into the boiler at any temperature required. This boiler will not require anyone to enter the flues for cleansing, as the flues are provided with shifting steppers at the ends, enabling a person to cleanse the flues even while the boiler is hot; this plan answers for any size or length boiler, and will do away with the cold water feed, which has been the cause of so many accidents. These flues are made of wrought or cast-iron. On the top of the tank a pipe will be placed, to take the waste steam that escapes and carry it to the cistern. The flues for a 6 ft. boiler will be 2 ft. long, and the usual width. It must be remembered that the tank once hot will remain a hot body, with the same amount of heat that passed off before in the brick flues. I would observe that there will be no more water taken from these tanks than will be required for the feed, consequently no more cold water will pass into these tanks than will be necessary for feeding. It is believed this plan will SAVE TEN FEET in the LENGTH of BOILER, and it has been proved to EFFECT a SAVING of rather MORE than ONE-THIRD in the CONSUMPTION of FUEL. These boilers, with flues and tanks, can be supplied on the most reasonable terms.

NOTE.—This plan of Flues and Tank Boiler will be found very beneficial for MARINE ENGINES; the tank would receive the water from the sea, and would not only become hot for feed, but would be the means of preventing in a great measure the salt from passing into the boiler. Where great quantities of hot water are required for other purposes, these tanks will also be found very beneficial. JOHN JEWELL.

Basset Foundry, Devoran, September 30, 1863. 165

*** Mr. JEWELL is PREPARED to GRANT the ROYALTY to any parties, for certain districts of the United Kingdom.

TO IRON AND COAL MASTERS, MINING AND QUARRY COMPANIES, &c.
IMPROVED BLACK VARNISH,
FOR PREVENTING IRON FROM RUST, AND WOOD FROM DECAY.

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This oil gives a pure, white, soft, and brilliant light, easily regulated, portable, and is half the price of colza, rape, seal, &c. The light of an ordinary burner with this oil is equal to eight sperm candles, and no grease. Messrs. GLOVER and Co. have had great experience in sampling, and can always guarantee a prime article. For works or public buildings, where gas is not desirable, the brilliancy and economy of the article are unequalled. Sold in iron-bound casks of 30 gallons.

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Not liable to leak, and which economise space in the stores. From 600 gallons, 48 diameter by 84 in height, price £10 10s., down to 10 gallons, 15 diameter by 21 in height, price 15s., WITH EVERY VARIETY OF SIZE AND PRICE BETWEEN.

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2½ galls. .. 4s. 6d. | 3 galls. .... 5s. 0d. | 3½ galls. .. 5s. 6d. | 4 galls. ....6s. 0d.

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TURPENTINE SUBSTITUTE, 3s. per gallon, in 30-gallon casks.

GLOVER AND CO., No. 40, MANESTY LANE, LIVERPOOL. 164

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APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects armers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

1.—It utilises from 90 to 92 per cent. of the motive power.
2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.
3.—It occupies a very small space.
4.—It raises water from any depth with the same facility and economy.
5.—It raises with the water, and without the slightest injury to the apparatus, sand, mud, wood, stone, and every object of a smaller diameter than its tube.
6.—It is easily removed, and requires no cleaning or attention.

A mining pump can be seen daily at work, at Wheal Concord Mine, South Sydenham, Devon, near Tavistock; and a shipping pump at Woodside Graving Dock Company (Limited), Birkenhead, near Liverpool.

J. U. BASTIER, sole manufacturer, will CONTRACT to ERECT his PATENT PUMP at HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors, and others, for the USE of his INVENTION.

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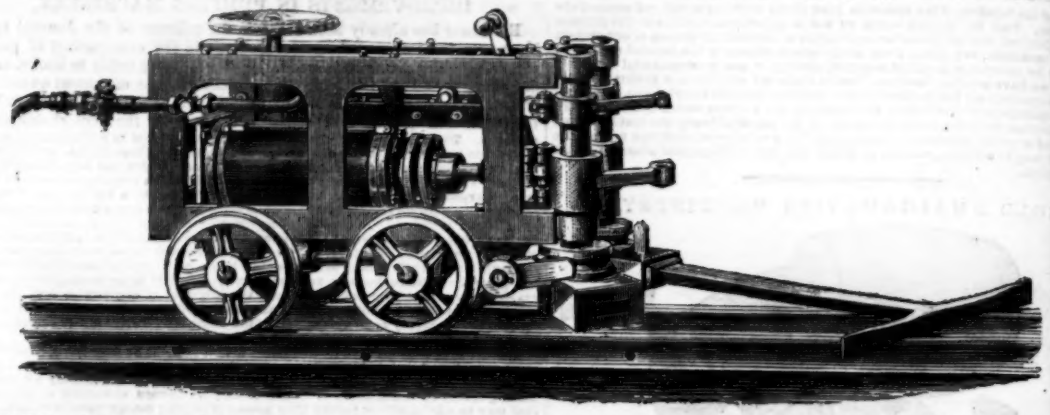

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Contractors' Locomotive. Stationary Engine. Steam Crane. Hoisting Engine. Agricultural Engine.

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6	horse power, pair of cylinders	4½	in. diameter	×	9	in. stroke	£300	15	horse power, pair of cylinders	7½	in. diameter	×	14	in. stroke	£540
9	„	„	5½	„	× 11	„	350	21	„	„	8½	„	× 14	„	600
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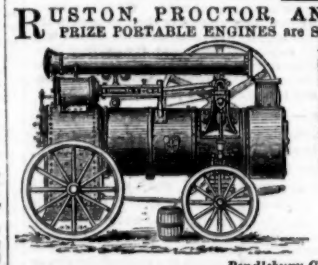

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We are, yours respectfully, ANDREW KNOWLES AND SONS.

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No. 4 „	22	„	.....	40s. „
No. 5 „	24	„	.....	44s. „

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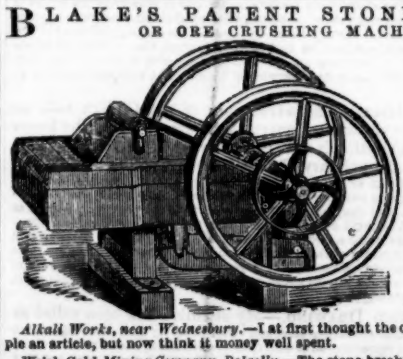

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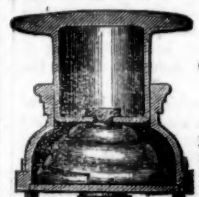

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